

Customer No.: 31561
Application No.: 10/604,761
Docket No.: 9886-US-PA

REMARKS

Present Status of the Application

Claims 1-20 are pending of which claims 5, 12-13 and 18 have been amended and claims 19-20 has been newly added in order to more explicitly describe the claimed invention. Furthermore, the specification has also been amended to correct some minor typographical errors. It is believed that no new matter adds by way of amendments made to claims, specification or otherwise to the application. For at least the following reasons, Applicants respectfully submit that claims 1-20 patently define over prior art of record and reconsideration of this application is respectfully requested.

Discussion of Objections to Specification

The Office Action objected to the specification because some informalities, such as at paragraphs [0030] and [0035], the term "ions/cm²" as the unit for concentration should be -- ions/cm³--, which needs to be corrected in order to overcome the objections.

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly amended the specification. After entry of the above amendments to specification, it is believed that the above objections can be overcome. Reconsideration is respectfully requested.

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Discussion of Objections to Claims

1. *The Office Action objected to claim 13 because, at line 23, the term of "san" should read as -an-. Appropriate correction is required.*

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly amended claim 13. Reconsideration is respectfully requested.

2. *The Office Action objected to claims 5, 12 and 18 because the term "ions/cm²" as the unit for concentration should be -- ions/cm³--, which needs to be corrected in order to overcome the objections.*

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly amended claims 5, 12 and 18. Reconsideration is respectfully requested.

Discussion of the claim rejection under 35 USC 112

The Office Action rejected claims 13-18 under 35 U.S.C. 112, second paragraph, because there is insufficient antecedent basis for the limitation "the polysilicon layer" in line 6 of the independent claim 13.

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly amended claim 13. Reconsideration is respectfully requested.

Discussion of the claim rejection under 35 USC 103

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The Office Action rejected claims 1-18 under 35 USC 103(a) as being unpatentable over Fukata et al. (US-6,452,241, hereinafter Fukata) in view of Somekh et al. (US-4,231,811, hereinafter Somekh).

Applicants respectfully disagree and traverse the above rejections as set forth below. Independent claims 1, 6 and 13, are allowable for at least the reason that Fukata and Somekh substantially fail to teach, suggest or disclose each and every features of the proposed independent claims 1, 6 and 13.

More specifically, both Fukata and Somekh fail to teach, suggest or disclose a method comprising at least "performing a photolithography and etching process for forming a patterned photoresist layer, wherein the first region of the polysilicon layer is exposed and the second region of the polysilicon layer remain covered by the patterned photoresist, wherein the portion of the patterned photoresist layer covering the second region comprises a middle portion and an edge portion, wherein the middle portion is thicker than the edge portion, and wherein the middle portion and the edge portion of the photoresist layer are formed in different thickness through a non-exposing region and a partial-exposing region, respectively; and performing an ion implantation process by using the patterned photoresist layer as a mask for simultaneously forming a source/drain in the first region of the polysilicon layer and an LDD in the polysilicon layer underneath the edge portion of the patterned photoresist layer", as required by claims 1, 6 and 13. The advantage of process steps is that at least one masking step, one photolithography process and one ion implantation step can be substantially avoided. Thus, the reliability of the semiconductor device can be effectively promoted.

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To the contrary, Fukata, in Figure 6 col. 7, lines 8-30, substantially teach a step of forming a first patterned polysilicon layer 31 over the substrate and a gate electrode (second patterned polysilicon layer 32) and performing an ion implantation to form the LLD and source/drain in the polysilicon layer 31 using the gate electrode 11 as a mask. In other words, Fukata substantially fails to teach, suggest or disclose at least "performing a photolithography and etching process for forming a patterned photoresist layer, wherein the first region of the polysilicon layer is exposed and the second region of the polysilicon layer remain covered by the patterned photoresist layer, wherein the portion of the patterned photoresist layer covering the second region comprises a middle portion and an edge portion, wherein the middle portion is thicker than the edge portion, and wherein the middle portion and the edge portion of the photoresist layer are formed in different thickness through the non-exposing region and the partial-exposing region, respectively; and performing an ion implantation process by using the patterned photoresist layer as a mask for simultaneously forming a source/drain in the first region of the polysilicon layer and an LDD in the polysilicon layer underneath the edge portion of the patterned photoresist layer", as required by claims 1, 6 and 13.

Furthermore, Applicants would like to point out that Somekh, in Figure 5, substantially teaches a process of forming a photoresist layer with different thicknesses comprising forming a gate oxide (36) over the substrate (30), forming a polysilicon layer (35) on the gate oxide layer (36) and patterned photoresist regions (34a/b) on the polysilicon layer (35). Thereafter, portions of polysilicon layer (35) and gate oxide layer (36) are etched and then an ion implantation step is performed using the patterned photoresist regions

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(34a/b), polysilicon layer (35) and the gate oxide layer (36) as a mask to form a single doped region (41) on two sides of the patterned photoresist regions (34a/b). In other words, Somekh substantially teaches a process of forming the doped regions (41) using a patterned photoresist regions (34a/b) with different thickness for ensuring the gate (35a) and gate oxide layer (36a) are spaced apart by a distance (d). In other words, Somekh substantially fails to teach, suggest or hint forming LLD (and the source/drain drain) using the patterned photoresist regions (34a/b) with different thickness, therefore Somekh cannot possibly suggest or hint that a patterned photoresist with different thickness could be utilized for forming the LLD and combine with Fukata in a manner suggested by the Examiner to achieve the features of the claimed invention as claimed in claims 1, 6 and 13.

Therefore, it is clear that Fukata and Somekh substantially fail to teach, suggest or disclose every features of the claimed invention as claimed in the proposed independent claims 1, 6 and 13. Furthermore, because claims 6 and 13 also recite features similar to claim 1, and therefore the proposed independent claims 6 and 13 are also allowable over Fukata and Somekh. Therefore, the proposed independent claims 1, 6 and 13 should be allowed.

Furthermore, Applicants respectfully submit that because the new claims 19-20 also recite features similar to claims 1, 6 and 13, therefore, claims 19-20 also patently define over Fukata and Somekh for at least the same reasons as discussed above.

Furthermore, both Fukata and Somekh substantially fail to teach, suggest or disclose a method of forming TFT comprising at least a step of forming the gate oxide layer over the source/drain and LLD after forming the source/drain and the LDD as further required by the

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newly added proposed independent claims 19-20, instead Fukata, in Figures 5, 6 and 7A, col. 6, lines 16-22, substantially teach a step of forming the gate oxide layer before the ion implantation step and a step of implanting ions through the gate oxide layer to form the LLD and source/drain in the polysilicon layer 31, and Somekh, in Figure 5 substantially teaches a step of ion implantation after forming the gate oxide on the substrate. In other words, because both Fukata and Somekh substantially teach a step of forming the gate oxide layer and then performing a step of ion implantation to form doped regions, and therefore, both Fukata and Somekh cannot possibly teach or suggest or hint a step of "forming a gate oxide layer over the source/drain and the LDD after forming the source/drain and LDD" as required by the claimed invention as claimed in the newly added proposed independent claims 19-20. Accordingly, Applicants respectfully submit that the newly added proposed independent claims 19-20 patently define over Fukata and Somekh and therefore should be allowed.

Claims 2-5, 7-12 and 14-18, which depend from independent Claims 1, 6 and 13, directly or indirectly, are also patentable over Fukata and Somekh, at least because of their dependency from an allowable base claim.

For at least the foregoing reasons, Applicants respectfully submit that claims 1-20 patently define over Fukata and Somekh, and therefore should be allowed. Reconsideration and withdrawal of the above rejections is respectfully requested.

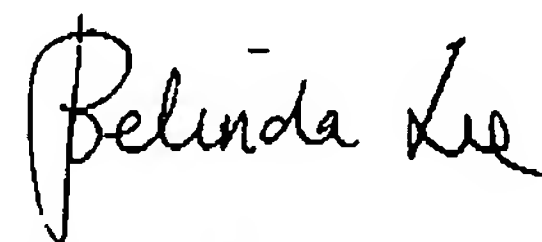
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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-20 of the present application patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted

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Belinda Lee

Registration No.: 46,863

Jianq Chyun Intellectual Property Office
7th Floor-1, No. 100
Roosevelt Road, Section 2
Taipei, 100
Taiwan
Tel: 011-886-2-2369-2800
Fax: 011-886-2-2369-7233
Email: belinda@jicgroup.com.tw
Usa@jicgroup.com.tw